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AUTHOR Doughty, Ted G.; Richiger, Georgina M.
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ABSTRACT

This publication includes curriculum materials on animals for grades 4-6. The major purposes of this publication are to foster individualized and interdisciplinary science and art activities within elementary classrooms and to provide pupils and teachers with suggestions to encourage the use of zoos, animal parks, and natural history museums. Activities are described for studying animal adaptations, prehistoric animals, animal conservation, animal behavior, and animals in captivity. (MH)

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SAN DIEGO CITY SCHOOLS
PROGRAMS DIVISION
INSTRUCTIONAL SUGGESTIONS BULLETIN

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CLASSROOM LEARNING CENTERS: ANIMALS LEVELS E-I

A Supplementary Approach for Teaching Science and Art

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Prepared by:

Ted G. Doughty
Georgina M. Richiger

Advisory Committee:

S.L. Giuliani
Carl H. Olson
Dr. Leven C. Leatherbury

SE 020 980

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PREFACE

This publication is one of two instructional suggestions bulletins for implementing Classroom Learning Centers related to animals, grades K-6. The first bulletin is concerned with primary grades, levels A-D. The second bulletin deals with upper grades, levels E-I. The major purposes of these publications are (1) to foster individualized and interdisciplinary science and art activities within elementary classrooms and (2) to provide pupils and teachers with suggestions to encourage the use of the San Diego Zoo, the Wild Animal Park, and the San Diego Natural History Museum.

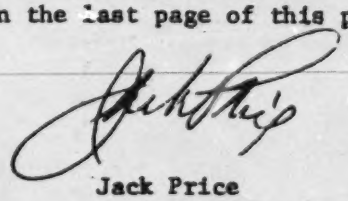
Also available are five consumable pupil booklets, one for each level, E through I. Each may be ordered in packages of ten from stock, using the stock numbers listed below:

31-C-3001	Classroom Learning Center:	Animals, Level E (Animal Adaptations)
31-C-3002	Classroom Learning Center:	Animals, Level F (Prehistoric Animals)
31-C-3003	Classroom Learning Center:	Animals, Level G (Animal Conservation)
31-C-3004	Classroom Learning Center:	Animals, Level H (Animal Behavior)
31-C-3005	Classroom Learning Center:	Animals, Level I (Animals in Captivity)

Acknowledgments for assistance from beyond the advisory committee should be made to Cora Jensen and Kathy Meagher of the San Diego Zoo Educational Staff and Howard Weisbrod of the Natural History Museum. Also, Dr. James Retson and Charlene Roux were instrumental in providing a district in-service class on individualizing instruction during the summer of 1971, which influenced the development of this bulletin.

Other acknowledgments include the team of six teachers at Carson Elementary School who in 1971-72 implemented a Teacher-Initiated Project related to individualized instruction with administrative support from the principal, Jack Radican.

This instructional bulletin, of course, is subject to further evaluation and refinement. Suggestions for improvement are welcome and will be appreciated. An evaluation form is provided on the last page of this publication.



Jack Price
Assistant Superintendent
Programs Division

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INTRODUCTION

Point of View

Current technology and civilization are causing animal species to become extinct at a rate of one species or subspecies a year. This is reason enough to place more emphasis on teaching about animal life. The management and care of the biosphere are essential to the future well-being of mankind. There is deep concern that pupils have knowledge, skills and attitudes to help correct the misuse of animals. Also, the lives of pupils may be enriched as they recognize and express the aesthetic qualities of animals, be they frogs or elephants.

Classroom Learning Centers: Animals offers a supplementary approach to the teaching of science and art.

Goals

Through the learning activities and suggestions included in the *Classroom Learning Centers: Animals* pupils will:

1. Develop care and concern for animals and their importance to a balanced ecosystem.

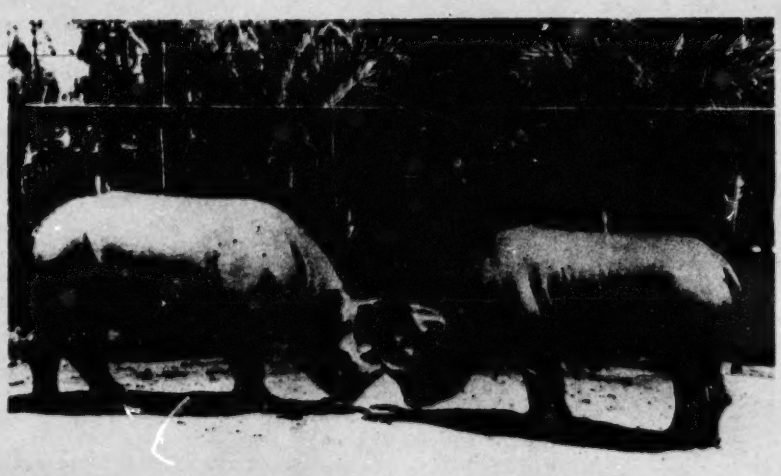
2. Develop greater capacity for learning science and art concepts independently in regard to animals.

3. Utilize the zoo, the Wild Animal Park and the Natural History Museum as science and art learning resources.

4. Decide what optional activities and projects in science and art are best suited to individual interests and aptitudes.

5. Develop selected aspects of attitudes, rational thinking, skills and knowledges as related to science concepts.

6. Develop selected aspects of visual and tactile perception, creative art expression, art heritage awareness and aesthetic judgment as related to art components.



Description of Classroom Learning Centers

Classroom Learning Centers are refinements and improvements of the familiar interest centers, science corners, book nooks, project areas, etc.--approaches that teachers have used for years.

The refinements in Classroom Learning Centers are significant:

...They emphasize instruction and learning, not pastimes, busywork or hobbies.

...They expand teachers' effectiveness in many ways.

...They help students instruct themselves.

...They bring together and coordinate materials for quality instructional activities.

...They encourage students to pace themselves and schedule much of their own work.

Learning Centers are compactly arranged sets of materials and directions that fit easily into different areas of the classroom. Corners serve as good locations for Learning Centers because they provide extra wall space. Other favored locations include areas near shelves, bookcases, cabinet tops, and bulletin boards. Almost any Center needs places for storing materials, completing activities, and displaying completed work.

Instructional Advantages of Classroom Learning Centers

Learning Centers enhance instruction in several ways:

1. They bring materials and activities together into a compact, organized cluster.

2. They encourage students to take initiative in scheduling, beginning, and completing learning activities.

3. They lend themselves to multimedia use in learning.

4. They can provide basic instruction, application activities, and enrichment activities.

5. They provide a balanced combination of structure and student freedom.

6. They can be organized around a large variety of topics.

Steps Taken To Prepare the Classroom Learning Center Activities

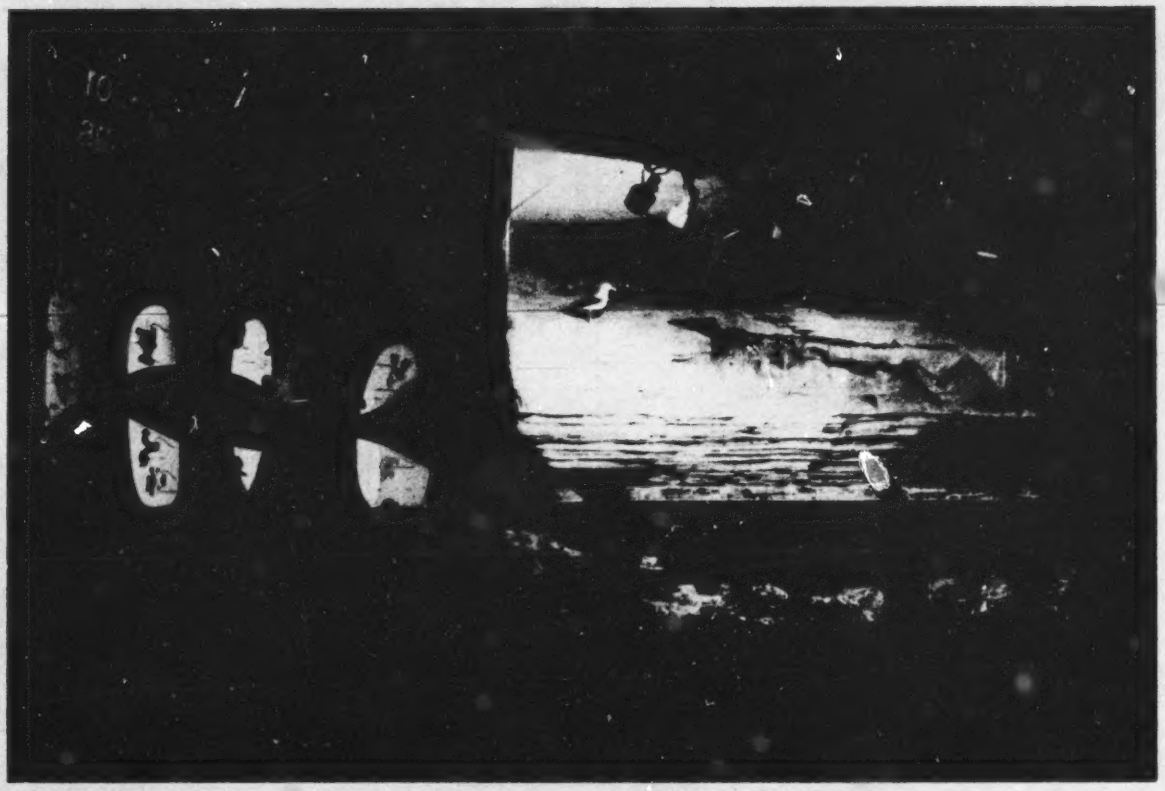
The following steps were taken in order to construct the CLC learning activities about animals:

1. Topics were selected which relate to current needs and/or problems in the schools and society related to animals, i.e. ecology and environmental problems.

2. Experience-activity type objectives were written around goals, concepts and components in science and art. These objectives were project-oriented.

3. Nongraded activities were developed for nine levels in graduated complexity, from A to I.

4. Related support materials and animals were researched and listed for each level as being readily available and collectible by the teacher.



Classroom Learning Centers: Animals--Correlation Chart

	LEVEL	UNIT	ANIMALS AND INSTRUCTIONAL MATERIALS EMPHASIZED	SCIENCE CONCEPT	ART COMPONENT
PRIMARY GRADES	A	Animal Babies	Guinea pit Sculpture kit K-1	Living things are interdependent with one another and with their environment.	Living things have visual characteristics (color, texture, pattern, etc.) which distinguish each species.
	B	Animal Communities	Goldfish, snail Tempera paint and patterns	Same as Level A.	Shapes can be seen in animals.
	C	Animal Habitats	Frog Tempera paint and old magazines	Same as Level A.	Color can be mixed from other colors; it can be dark or light, it can contrast or camouflage.
	D	Web of Life	Aquatic insects Papiér mâché, clay	Same as Level A.	The size and relationship of an object in a painting determines the importance to the viewer.
UPPER GRADES	E	Animal Adaptations	Lizard, mouse Crayons	A living thing is the product of its heredity and environment.	Same as Level A.
	F	Prehistoric Animals	Audio-visual aids, books Clay	Living things are in constant change.	Texture provides variety in our visual and tactile world.
	G	Animal Conservation	Audio-visual aids, books Assorted art materials	Same as Level A.	Color and composition express emotional feelings in painting.
	H	Animal Behavior	Mouse Assorted art materials	Same as Level E.	Living things have a quality of roundness or form.
	I	Animals in Captivity	Mouse, guinea pig Art prints and soundstrips	Same as Level A.	Artists create a style unique to them and to the time in which they live.

Organization and Rationale of CLC Booklets

Each CLC booklet is sequenced and organized as follows for teacher and pupil use in grades 4-6 (levels E-I):

UPPER GRADES

1. *Title page*...shows the level, science concept, art component, topic, and illustration (cartoon related to the topic).
2. *Page 1 first paragraph*...is a motivational paragraph designed to give a glimpse to the pupil of what is in the CLC.
3. *Personal inventory*. This section helps the pupil assess in his own mind what he knows and does not know about the topic. It also requires the pupil to record this information in a CLC notebook.
4. *Beginning activities*. This section offers the pupil several basic and limited projects at the CLC in science and art.

5. *Materials.* Materials for the beginning activities and some long-range projects are listed in this section. This list is for the teacher to use in collecting those materials needed by pupils before introducing the CLC. The list usually includes library books, filmstrips, study prints, and science and art supplies. Animals are also listed in some CLCs.

6. *Here is what you do.* This section offers the pupil two or more long-range science-art projects using the CLC materials. The section provides for a wide range of interests and abilities within a classroom.

7. *Contract for more study.* A considerable number of science-art projects are listed in this section for pupils who are highly motivated to work independently and productively. A pupil choosing one of the projects should be required to discuss the project with the teacher first for planning, clarification and signing a contract as to completion and presentation of the project.

   Project trips to the zoo, Wild Animal Park and Natural History Museum are some of the activities listed in this section for pupil choice.

8. *Bulletin board or display idea.* This page is sometimes included for either the pupil or the teacher to consider in setting up the CLC.

Management of the Classroom Learning Centers

I. Introducing the Center

The way you introduce the Learning Center sets its tone for several days. Be enthusiastic about it. Be thoroughly prepared to explain every aspect. Give special attention to:

-What we can do in the Center.
-How we do each activity.
-Where we keep the materials.
-How we take the materials out, use them and replace them.
-Where we put finished work.
-How we keep records.

You will also need to discuss scheduling, responsibilities, and behavior for working in the Center.

II. Scheduling

After you have introduced the Center and students have had an opportunity to walk through it, you are ready to schedule work periods in it. Basically, you need to devise a way to show who is to work in the Center at specified times. Teachers usually allow students to choose to work in the Center during free times. They also assign students to the Center as needed. It helps to provide a schedule that everyone can see. You might want to make scheduling devices such as circular charts, pocket charts, clothespin boards, contracts, simple chalkboard notes, or even "postcards" from you to students.

Sometimes you will probably want students to work individually in the Center. At other times they can work in groups. The schedule should provide equal and ample time for all students.

III. Materials

To begin, bring together most of the instructional materials. As students get acclimated to the Center, they will be able to add activities and materials of their own.

Students should understand:

-Where materials are stored and how to get them.
-How and where to use the materials.
-What to do with materials when finished.
-How to care for the materials.

IV. Instructing

Despite your best planning, students will occasionally encounter difficulties with instructional activities. Be ready to instruct them as needed, either in the Center or elsewhere. Try to work in the Center with students as much as possible.

V. Monitoring

Especially in the early stages of using the Center, keep careful watch over what goes on there. Position the Center so it is visible from throughout the room.

VI. Assessing Performance

You will want to know several things about students' work and progress in the Center:

-Which activities they complete.
-How well they perform the learning tasks.
-What skills and information they acquire.
-How willing and eager they are to use the Center.
-Which activities are most popular, and which seem to teach most.

You obtain this information by observing students at work, noting their interest in going to the Center, examining work they have completed, and conferring with them informally, and occasionally, if you wish, by testing them over the content of the Center.

VII. Record Keeping and Evaluation

Try to keep accurate records of what has transpired in the Center. Use a checksheet to keep track of who does what--who begins activities and who completes them, and who reaches various stated objectives. Examine completed work to determine its overall quality. Conduct individual conferences to find out what students especially like and dislike about the Center, and what they think they have learned. Keep folders for each student, in which you place samples of work and notes from the individual conferences.

PUPIL CLC BOOKLETS

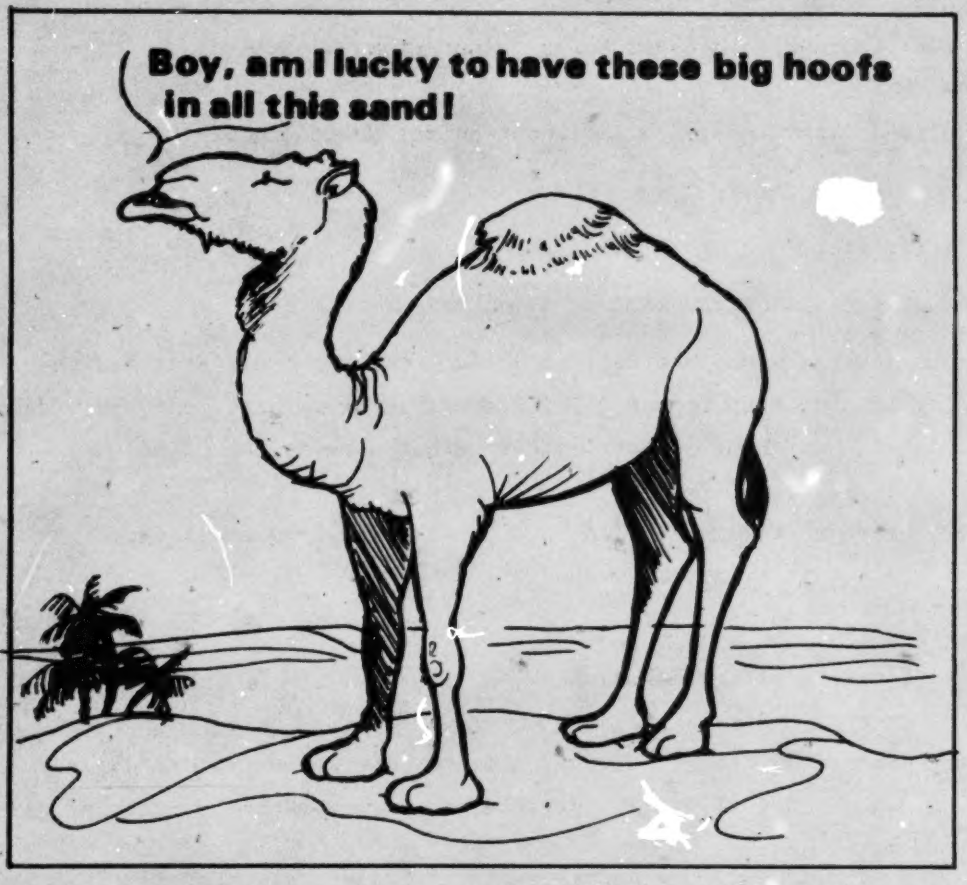
STOCK NO. 31-C-3001

CLASSROOM LEARNING CENTERS: ANIMALS

PUPIL BOOKLET E

Animal Adaptations

- *A living thing is the product of its heredity and environment.*
- *Visual and tactile perception.*



Note to the teacher: Before giving this booklet to a pupil, please refer to the Instructional Suggestions Bulletin entitled *Classroom Learning Centers: Animals (Levels E-I)--A Supplementary Approach for Teaching Science and Art,* Stock No. 41-S-0102.

Hello!

The topic of this booklet is animal adaptations. Examine the booklet before you start to work. Work with the beginning activity. (Note the materials available.) Make a contract with your teacher to do some follow-up work. Good luck to you.

Personal inventory

In your CLC notebook, copy and complete the following statements:

1. I want to know more about animal adaptations because

2. I already know the following about animal adaptations

Beginning activities

By doing these activities you will be able to:-

1. Write several sentences telling why you think the elephant and the tiger have different feet. Think about an elephant's foot. How does it look? How about a tiger's foot? What does it look like?

2. With crayons draw an elephant's and a tiger's legs and feet.

Materials

-CER study prints of zoo animals

-Library books:

	599 & Sci (I)	Goudey, Alice E. *Here Come the Elephants!* Illustrated by Garry MacKenzie, Scribner, 1955.
	599	Hogner, Dorothy Childs. *The Cat Family.* Illustrated by Nils Hogner, Oxford, 1956.

-Filmstrips:

Fs 591.5	Adaptations in Animals
Fs 599.5	Cat Family

-Box of crayons

-Manila drawing paper

Here is what you do:

1. Find the study prints of the elephant and the tiger. Look closely at their feet. Think about how they are similar. Also think about how they are different. Are the legs thick or thin? How do their toes look? Are the legs furry or rough looking?

2. Using crayons, draw a picture of the elephant's feet. Draw a picture of the tiger's feet. Label each drawing, ELEPHANT FEET and TIGER FEET.

3. Make a drawing of an elephant in the jungle on a separate sheet of paper. Look again at the study prints. Are the legs strong looking? Or fragile? Do the legs you drew have the same quality?

4. In your CLC notebook, write answers to these questions:

   a. How are elephant and tiger feet different?

   b. What do you think they do with their feet?

   c. How do you think the tiger feet developed the way they did?

   d. How do you think the elephant feet developed the way they did?

Bulletin Board Idea

CONTRACT FOR MORE STUDY ON ANIMAL ADAPTATIONS

Here are the projects related to the activities you just finished. These are additional activities for you to explore. With these projects, you will know more about animal adaptations. Keep a record of what you do in your CLC notebook.

1. Look at the feet of all the animals in the CER study prints. Draw six of them. Make up a theory for the six animals--how did they develop the kind of feet you see?

2. Go to the zoo. Select one of the following two activities: (a) Draw three examples of animal legs. Bring the drawings back to class. Describe how you think the animal developed the kind of legs you observed and sketched. (b) Draw three animals that have adapted to their environment by color. With crayons, pastels or felt pens, color or make notes on the colors. Tell why you think the animal's coloring would be important in the natural environment.

3. View the pictures in the books and filmstrips at the CLC. Do the same as in No. 2 above, except draw the head of the animal.

4. Make a diorama showing how a polar bear is adapted to cold climates, and how a camel is adapted to hot climates.

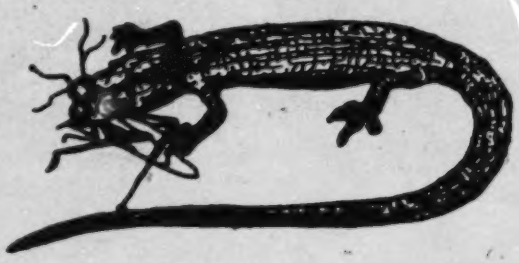
5. Record the following words in your notebook. Be able to tell what each word means. Use a dictionary.

adaptation	competition
survival	carnivores
predator	species
prey	environment
camouflage	

6. Study two small animals in the classroom. Keep a record of how they use their feet. Try to construct an environment as close as you can to the one the animal would have in the wild. You may wish to make a science/ art chart to show what you do day by day for several weeks. Example:

ANIMAL ADAPTATIONS

How do lizards and mice use their feet in their environments?



Lizards use their feet to:

Mice use their feet to:

7. Make a series of three paintings of different activities your animal does during the study. Be sure to make the animals larger than life size in your painting.

Think about where the animal you are studying would be found naturally. Where would it choose to be if it could choose?

E-5

8. Create a painting showing the animal you have studied in its natural environment. Use watercolors or tempera paint.

STOCK NO. 31-C-3002

CLASSROOM LEARNING CENTERS: ANIMALS

PUPIL BOOKLET F

Prehistoric Animals

- *Living things are in constant change.*
- *Texture provides variety in our visual and tactile world.*

Note to the teacher: Before giving this booklet to a pupil, please refer to the Instructional Suggestions Bulletin entitled *Classroom Learning Centers: Animals (Levels E-I)--A Supplementary Approach for Teaching Science and Art*, Stock No. 41-S-0102.

Hello! How are you today? The topic of this booklet is prehistoric animals. Please look through the entire booklet before you start to work. When you finish the beginning activities, you may want to try one of the contract activities. See the teacher for directions. Hope you learn much and enjoy this prehistoric animal study.

Personal inventory

In your CLC notebook, copy and complete the following statements:

1. I want to know more about prehistoric animals because

2. I already know the following about prehistoric animals

Beginning activities

By doing the beginning activities you will be able to:

1. Develop several reasons in your own words for explaining the theory that dinosaurs once roamed the earth.

2. Recognize and use words to describe different textures.

Materials

-Books:

568 & Sci (U) — Blough, Glen Orlando. *Discovering Dinosaurs.* Pictures by Gustav Schrotter. McGraw, 1960.

560 — Farb, Peter. *The Story of Life, Plants and Animals Through the Ages.* Illustrated by W.R. Lohse. Watts, 1956.

560 — Fenton, Carroll Lane. *Prehistoric World: Stories of Animal Life in Past Ages.* Illustrated by James E. Allen. Day, 1954.

731 — Rottger, Ernst. *Creative Clay Design.* Van Nostrand Reinhold, 1972.

A Guide to Rocks, Minerals, and Fossils of San Diego. San Diego City Schools, (Stock No. 41-R-9100), 1957.

Art Guide: Creative Experiences with Clay. San Diego County Department of Education

Textbook: *Concepts in Science 5*, pages 305-38.

-Cassette: 568.19 I Can Read About Dinosaurs P or I

-Filmstrips: Fs 560 Mammals Inherit the World
Fs 560 Prehistoric Animals

-Study Prints: SP-S 560 Prehistoric Animals and Plants: Mesozoic Era
SP-S 560 Record in the Rocks

-5" x 8" cards

Here is what you do:

1. Observe, read and browse through the books, study prints, and filmstrips. Find facts which scientists use to explain the existence of dinosaurs on the earth millions of years ago. Without copying anything, do the following:

   a. Obtain three to five 5" x 8" cards and a pencil.

   b. Think of all the facts you can which lead scientists to theorize that dinosaurs roamed the earth. Write one fact on each card.

   c. Write down, in your own words, several scientific reasons for the theory that dinosaurs once lived upon the earth. If you have trouble with writing, ask a pupil who writes well to write what you say for you. (Writing goes in the CLC notebook.)

2. Animals that lived during the time of dinosaurs were in some ways like the ones today. Some could fly; some could swim. They were also large and small. They had special coverings on their bodies like the birds and animals of today. They had feathers, fur, skin and scales. Their body coverings had textures and patterns.

   Texture is the way something feels as well as how it looks, perhaps like the hard shine of a chrome bumper on a car or the soft fur of a cat.

Make a chart of a collection of ten different kinds of textures. Start today by making a list of different kinds of texture words similar to this:

coarse
smooth
bumpy
etc.

Now that you have made a list, think about things you can find around school or at home that you could glue to your chart to share with others. Make changes in your list if you do not think you could find a particular one to put on the chart. (If you are really ambitious, you might make your list even longer.)

On a separate sheet of paper make a list of things you will bring from home or elsewhere.

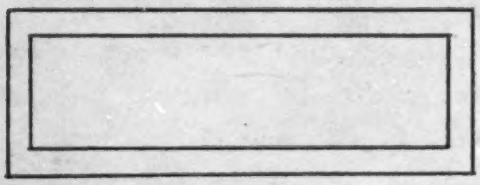
To make your chart you will need:

1 sheet of tagboard
10 pieces of light-colored paper about 1" x 12" (print the texture words on these)
1 felt pen
White glue
1 yardstick
Pencils
Texture items

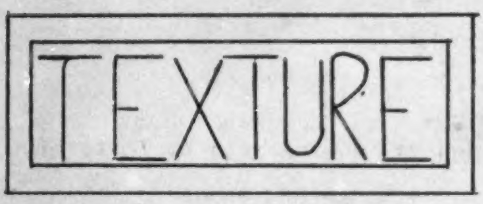
Decide on a title for your chart and where you will place things on the chart. (Be sure not to glue anything until you are certain everything will fit.)

You might like to make the title this way:

a. Measure out and lightly mark an area like this on your tagboard.



b. Lightly (Don't press hard) print in the letters. (You might use all capital letters.) Make them go from top to bottom of the shape you drew.



c. Now fatten up the letters. (Make them thicker.)

d. Color them in with a felt pen.

Arrange the texture words on the colored pieces of paper--one word for one piece of paper.

Lay all things on the tagboard. If you are pleased with the way it looks then carefully pick up one thing at a time to glue it in place. (Be careful to glue neatly.)

You may now check with your teacher to see where to display your work. (If you have done a very good job on your chart, you might want to give it later to a kindergarten teacher for the children to use.)

CONTRACT FOR MORE STUDY ON PREHISTORIC ANIMALS

Here are the projects related to the activities you just finished. These are additional activities for you to explore. With these projects, you will know more about prehistoric animals. Keep a record of what you do in your CLC notebook.

1. Visit the Natural History Museum. View the prehistoric animals exhibit. Sketch and label the skeleton of two prehistoric animals. Guess the answers to these questions and record them in your CLC notebook:

    a. How were the animal's teeth used?
    b. How fast could the animal move?
    c. What might have caused the animal to change?

2. Visit the San Diego Zoo. Before you go, do research to learn of three or more animals that lived 60 million years ago and now have living relatives in the zoo. For example, EOHIPPUS (ee-uh-HIP-us) lived millions of years ago and it is theorized that he became the horse and the zebra. (Eohippus was the size of a fox.) After your visit to the zoo write a short report on each animal that you observed. In your report tell why you think the animal changed over the millions of years.

3. Collect and label fossils from around San Diego County. First examine the fossils in the *Concepts in Science Lab 5*, Box Y-9. You may need to go to the public library, and also to use the teacher guide entitled *Rocks, Minerals, and Fossils of San Diego*, Stock No. 41-R-9100 (San Diego City Schools publication).

4. Animals of the future:

    a. Choose a friend to work with you on the following activity:

        Look again through the books on dinosaurs for the pictures or illustrations. Choose three different kinds of dinosaurs that have interesting skin coverings. With the pictures in front of you, talk over the following questions for each dinosaur. Compare all. (Remember that there are no "for sure" right or wrong answers and that both of you should try to guess possible answers.)

What covers the body (feathers, fur, etc.)? How would it feel to touch? Why do you think this was the covering instead of something else? How might it have helped the animal to have this body covering?

What kind of legs and feet does it have? What would this tell you about where it lived?

What size was the body? What could you compare it to today? Would this affect the way it moved or where it moved? Did it fly or walk? Was this perhaps for protection or to help it get food? What kind of coloring did it have? Could you think of two or three reasons why it might have this coloring? Can you guess from the head size and shape what kind of food it ate? What might it have eaten?

b. The dinosaurs "fit" or were suited for the environment and the time in which they lived, as you may have guessed from talking about the questions in Part a. The earth today is not the same as when they lived. How is it different? On a piece of paper, make a list of five things that are different. Title the list "different." On the same piece of paper, make a list of five things that are the same. Title this list "same."

The earth will be even more different in another million years because many things will change between now and then. On the same sheet of paper make a list of five possible changes.

c. You will need paper, two sheets newsprint 9" x 12", one sheet paper 24" x 36", pencils, crayons or felt tip pens or watercolors.

How will animals living a million years from now be different? Will any of the following have changed because the environment has changed?

-Eyes? If so why?

-Ears? What would cause them to change?

-Size of animal? What might have happened to cause this change?

-Skin covering? Why?

-Legs and feet? Would they have to be used differently? Why do you think so?

Now that you have discussed these, each of you is to make, on the small paper, a sketch of an animal that might live a million years from now. (Be creative!)

Look over both sketches and decide which one or which parts of both would be best for the large drawings or painting. Work together to make the large animal. (Be sure to draw large to make it fit the paper. You might want to draw it very lightly first.) Also, don't forget to texture the skin covering carefully and neatly.

5. Dinosaur's life mural:

You will need pencils, 9" x 12" newsprint, tempera paint, brushes, mural paper, water containers, charcoal.

The way we feel when we are happy, sad, scared, excited, or miserable are our emotions. We experience different emotions as things happen to us, and we feel certain ways when they happen. Animals have feelings also. We know they can "feel" fear because they fear a forest fire or lightning and thunder. (We are not saying they feel exactly the same as humans.)

How would you act and what would you look like if you woke up in the night and found your whole bedroom burning? Would you look the same and act the same if you had just won a trip to Disneyworld?

Try to put yourself in the place of a dinosaur living long ago; and for one of the titles below, think how the dinosaur would have looked and what it would have done. Then choose one title for your mural.

-I feel fear in the night! Help me!

-I relax and enjoy the coolness of a grove of giant tree ferns.

-Disaster at the waterhole.

-I romp and enjoy my childhood with the herd.

On the 9" x 12" paper make a sketch of your idea. Look at your sketch. Does it show the animal in a position that makes it show how it feels? Does it look frightened? Or relaxed? Or enjoying?

Is the animal large enough to be the most important part of the picture? Will you need to make changes on any of those things? If you will need to, write down the changes you should make on the sketch in the right place. On the mural paper draw your picture lightly with charcoal. (Be sure to make the changes.)

Hints: Before you paint...

-It is easier to do the things in the background or behind the dinosaur/ dinosaurs first.

-Colors will be more pleasant if you mix them with other colors to get different kinds of colors such as different kinds of greens or blues or reds.

6. Dinosaurs in clay:

Read all directions first. If you do not understand any part before you begin, make an appointment to discuss it with your teacher. You will need:

1 square of ceramic clay about 4" x 4"
1 clay board or a piece of chipboard about 9" x 12"
1 water container with water
1 popsicle stick or tongue depressor for cutting
1 T-pin for cutting slat pieces
1 rolling pin or dowel about 12" long
Creative Clay Design by Ernst Rottger.

You will need to know about clay:

-Clay comes from the ground.

-Clay has water in it to make it soft.

-If it has too much water in it, it will be sticky, gooey and not hold its shape.

-If it has too little water, it will not bend or hold together.

-Clay needs to be about the thickness of your little finger on the end.

-When you add clay to another piece of clay, you must wet both pieces to be put together and press them firmly; then smooth out edges. If not firmly attached, added pieces fall off when dry.

Now look carefully through the book for texture ideas in clay. To begin:

a. Use the clay board or chipboard to cover the table. Place about one half of the clay on it. Roll with the doweling or rolling pin.

b. Cut an interesting shape. Twist it, bend it, shape it and texture it in many ways. Experiment!

Now begin your dinosaur. Be creative and don't forget to enrich its appearance with texture. Good luck!

STOCK NO. 31-C-3003

CLASSROOM LEARNING CENTERS: ANIMALS

PUPIL BOOKLET G

Animal Conservation

- *Living things are interdependent with one another and with their environment.*
- *Color and composition express emotional feelings in painting.*

Note to the teacher: Before giving this booklet to a pupil, please refer to the Instructional Suggestions Bulletin entitled *Classroom Learning Centers: Animals (Levels E-I)--A Supplementary Approach for Teaching Science and Art*, Stock No. 41-S-0102.

Hello!

The topic of this booklet is animal conservation. Thousands of animals have appeared and disappeared from the earth over millions and millions of years. Most of this change, it is theorized, was the result of natural selection. Natural selection of animals is a theory which describes gene mutations, climatic and geographic changes and ice ages as related to a species living or becoming extinct. Technology as now used by civilizations is speeding up the extinction of many animals. "Today species are disappearing at the rate of one species or subspecies per year."[1] This is very disturbing, since every animal has its special place and job in nature's system. A world-wide effort is being made to help save endangered species, but more must be done and soon.

Please look through this booklet before you start to work. Work with the beginning activities, noting the materials available. Make a contract with your teacher to do some of the contract activities. Good learning to you!

Personal inventory

In your CLC notebook, copy and complete the following statements:

1. I want to know more about animal conservation because

2. I already know the following about animal conservation

Beginning activities

By doing the beginning activities you will be able to:

1. Observe and analyze data which show specific wildlife are in danger of extinction. Next, write a conclusion in your own words which tells what you think will happen to an endangered species native to San Diego County over the next ten years.

2. Make birds several different ways. You will also see large shapes within a bird that look three-dimensional.

[1] Lisa Shawner, "North American Wildlife: The Vanishing Act," p. 368, *Science News*, June 8, 1974. Washington, D.C.: Science Service, Inc., Vol. 105, No. 23, pp. 361-76.

Materials

-CER soundstrip, "Predators in Peril"

-Plastic mounts from Natural History Museum

a. Owl (Barn)
b. Owl (Burrowing)
c. California Rosy Boa
d. Southern Pacific Rattlesnake

(Only two mounts at a time for two weeks.)

-Filmstrips: Fs 598.97 Owls
Fs 598.12 Snakes: Helpful and Harmful
Fs 574.5 Animals, Plants, and Their Environment

-Study Print: SP-S 574.5 Ecology Series--Set 1

-Soundstrip: Ss 333.72 Water Conservation Today and Wildlife Conservation Today

-Books: 598 Stoutenburg, Adrien. *A Vanishing Thunder; Extinct and Threatened American Birds.*
598 Zim, Herbert. *Snakes.*
731 Rottger, Ernst. *Creative Clay Design.* Van Nostrand Reinhold, 1972.
Art Guide, Creative Experiences with Clay, Superintendent of Schools, Dept. of Education, San Diego County.

Here is what you do:

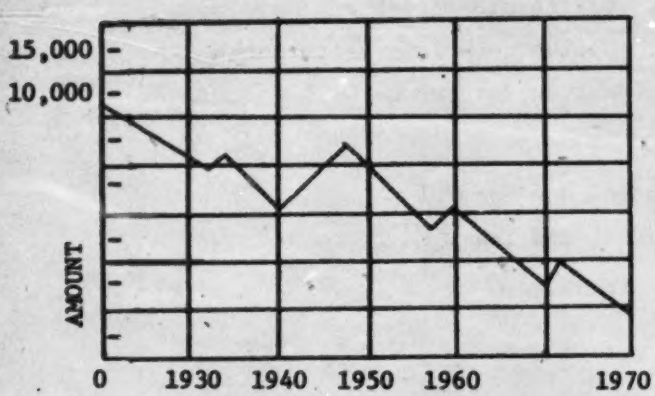
1. View the filmstrip and listen to the record from the "CER box" entitled, "Predators in Peril." Take notes on the frames which deal with the rosy boa and the barn owl. Now do any one of the following activities:

   a. View the filmstrips.

   b. View and listen to the soundstrip "Wildlife Conservation Today."

   Now, start analyzing the data you have gone over so far by choosing one to four animals and showing what you have found about their numbers in at least one graph. On the following page are samples of graphs for you to consider.

NUMBER OF OWLS IN
SAN DIEGO COUNTY
DURING LAST 20 YEARS

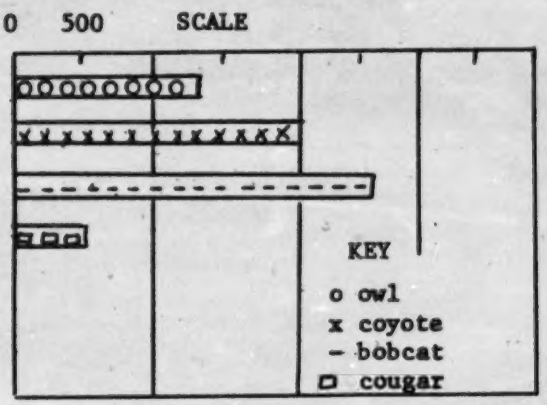


SOURCES: _____

_____

_____

ESTIMATED NUMBERS OF
FOUR PREDATORS
IN SAN DIEGO COUNTY
AS OF DECEMBER 1970



SOURCES: _____

_____

_____

Note: You may have to call or write to the United States Forest Service, California Fish and Game Division, or the Natural History Museum to get more facts.

2. Now that you have collected some data and put them into a graph, you are ready to write up a prediction about what you think will happen to the animal in the next ten years. Put your conclusion in your CLC notebook and be certain to show it to your teacher, along with your graph(s).

3. To do this activity you will need toothpicks and three dark sheets of colored construction paper (dark blue, purple, dark green or dark red).

   a. Think about birds you have seen. What kinds of birds are there? (Land birds, water birds, birds that eat insects, birds that eat fish--can you think of others?)

   b. Lay out the toothpicks on a piece of paper in the shape of a bird you remember. (Do not glue the toothpicks yet; continue on to the next step.)

c. Take more toothpicks and the other pieces of paper. Arrange two more <u>different</u> birds. (How about peacocks, penguins or pelicans--or maybe you have another good idea. Don't glue yet!)

d. Look at the three arrangements you have made. Which looks best? Why?

e. Now that you have selected the best arrangement, carefully pick up one toothpick at a time, put on glue and return it to its place until all pieces are glued.

f. How can you make your bird look like it has wings, feathers, eyes? (Remember, you only have glue, toothpicks, and paper to use. Go ahead, be creative with your materials.)

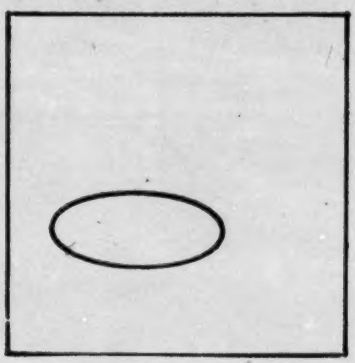
g. Return unused materials to proper storage place. Clean your work area.

h. Stand back and admire your work.

4. You will need a piece of drawing paper, pencil or charcoal, and encyclopedia or other book or magazine with pictures of birds.

a. Select an illustration of a bird that you like and would like to sketch.

b. Look closely at the body shape of the bird. Is it round, oval, rectangular? Sketch large work lightly and freely to make the kind of shape you see. (Make it fill the page!)



c. Look for other shapes in the bird--work quickly and sketchily. (Don't press hard and try to make each line perfect--it doesn't need to be!)

d. Remember those light, loose, free lines are not "forever" lines but to help you get things placed on the paper and in about the right area. Now look closely for details--eyes, beak, feathers, and dark and light areas. (You can press harder now and try to make lines more perfect.)

e. Shade in dark areas pressing fairly hard. Look at other areas that are not so dark but now white--try not pressing as hard. By shading you are making the bird look more round or showing that it has "form" or is three-dimensional. Does your bird look three-dimensional?

f. Does your bird look like the illustration you chose? Does it almost fill the paper? If not, you might want to think where the bird might be (on a beach, pier, in a jungle, on a roof top) and sketch it in.

5. Clean the area.

CONTRACT FOR MORE STUDY ON ANIMAL CONSERVATION

1. Gather information from as many sources as you can to write up an investigation about a vanishing species. The information should be kept on separate pages in your CLC notebook. Use these headings: (1) Important Variables, (2) Needed Controls, (3) Ways of Measuring What Happens, and (4) Apparatus Needed. Be sure to state a hypotheses or problem such as this: How does the population growth of people affect the population of cougars in San Diego County?

2. Visit the Natural History Museum or the zoo. Take snapshots of any of these vanishing species of North America: coyotes, golden eagles, red foxes, cougars and bobcats, timber wolf, grizzly bear, peninsula bighorn sheep, Utah prairie dog, black-footed ferret, Sonoran pronghorn, prairie chicken, alligator, and the California condor. Make a scrapbook which describes how some of these factors are contributing to the disappearance of the above animals:

-hunting	-destruction of habitat
-poisoning	-pollution
-trapping	-insecticides (including DDT)

3. Art activity: Mural

Does red make you feel sad? Does gray make you think of a sunny day?

There are warm and hot colors, cool colors, gloomy colors, bright colors, and dull colors. What colors would you use to paint a picture of a ghost haunting a house? Why? What colors would you use to show the feeling of the hottest day of summer? Why?

Colors are important. They make us feel certain ways when we see them.

When we decide to paint a picture, we need to think not only about the composition (the way things will be arranged on the paper) but also about the colors that will make other people feel the way we want them to feel.

Your assignment, if you should choose to do this, will be to use colors and good composition to make a mural. (Sorry, this paper will not self-destruct at the end of ten seconds but will try to help you do a good mural.)

The topic is birds. In addition you will need to select a title that you would like to paint.

Think what it would be like to be a bird (artist's approach).

a. Read and then choose one of the titles below (remember it must be about a bird or group of birds):

-I am trapped! I am trapped!
-I stand alone, all alone, in my flock.
-I can fly! I can fly! ...Look at me... I can fly!!!

Now that you have chosen a title, keep in mind that how birds feel is the most important part.

b. Look at the two illustrations below and choose the one you feel would have the title "My Friend."

In picture #2 the "friend" takes up most of the space on the paper, so the friend must be important. Picture #1 has trees larger than the friend, sun larger than the friend, etc.; therefore, the "friend" cannot be very important. Do you get the idea? If not, ask for help from an adult before you go on.

c. On a 9" x 12" sheet of paper make at least two sketches of your idea. Go back to "b." Discuss your sketches and your ideas with your teacher.

d. On your mural paper sketch your ideas lightly with charcoal or pencil.

e. Stand back and look carefully at your ideas. Do you need to change anything? If you do, take time now to do it.

f. Paint carefully. Be sure to mix your paint to get just the "right" colors you need. You might like to use a sponge or some pieces of cardboard to get interesting textures and lines.

g. Ask someone else to see if they can tell which title you chose. Did you do a good job?

4. Art activity: Clay

For this activity you will need:

Creative Clay Design by Ernst Rottger
Clay
T-pins
Rolling pin or dowel
Clay board or chipboard approximately 12" X 12"

a. Look quickly through the book. When you have finished, go back to pages 39, 40, and 41 to look more closely at the ideas. These pieces were made by starting with a flat slab of clay and adding pieces onto it. Notice how the birds fill the space; they almost touch all the edges (top, bottom, sides). Close the book.

b. Think about what you already know about birds and their shapes, such as how their beaks are shaped, their feet, and their feathers.

c. There are several things you should know about clay before you continue.

-Clay should be about the thickness of your little finger. If it is thinner it will probably break.

-Small clay pieces must be firmly attached to the large piece or they will fall off later as the project dries.

d. On the clay board or piece of chipboard roll the clay using the roller or dowel until the clay is the thickness of your little finger. Cut the outside shape with a T-pin.

e. Decorate with coils or balls. Be creative in designing your bird.

Bulletin Board Idea

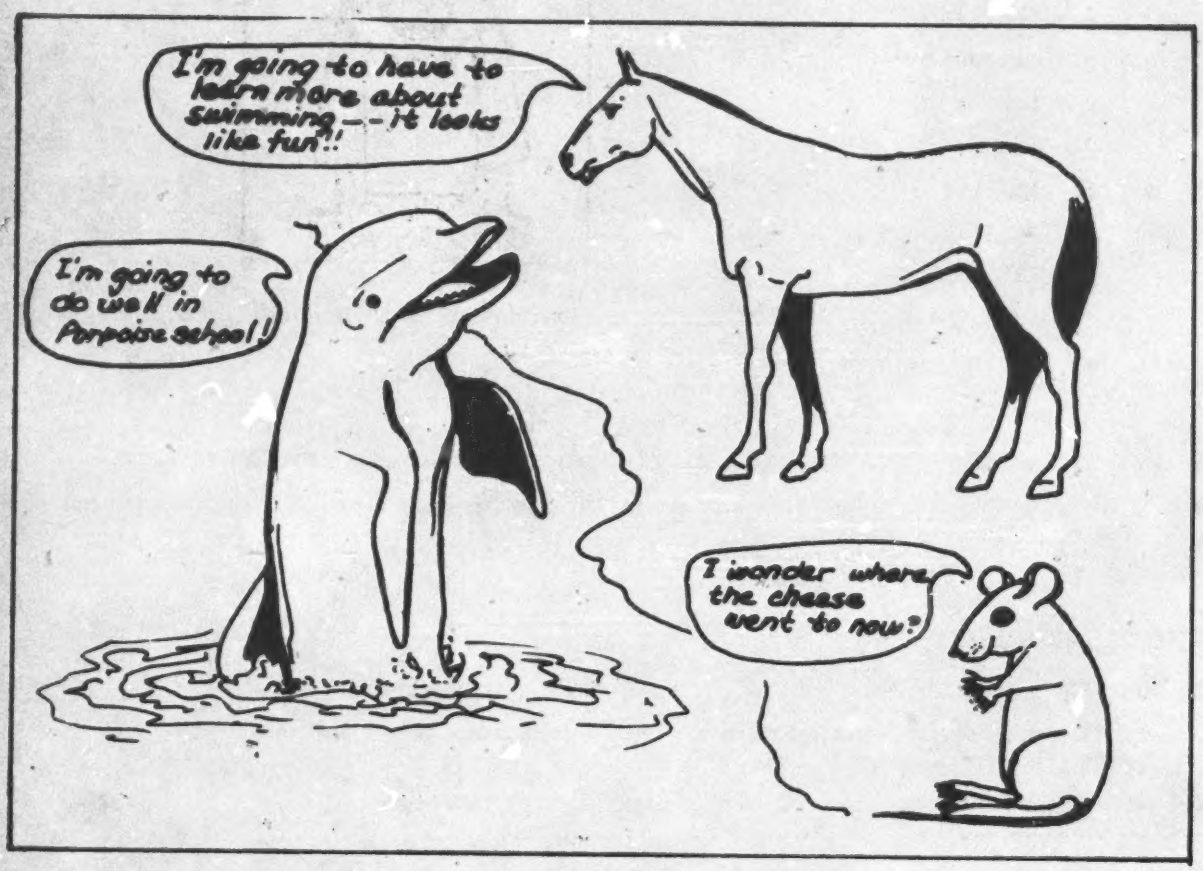
STOCK NO. 31-C-3004

CLASSROOM LEARNING CENTERS: ANIMALS

PUPIL BOOKLET H

Animal Behavior

- *A living thing is the product of its heredity and environment.*
- *Living things have a quality of roundness or form.*


I'm going to have to learn more about swimming--it looks like fun!!
I'm going to do well in Porpoise school!
I wonder where the cheese went to now?

Note to the teacher: Before giving this booklet to a pupil, please refer to the Instructional Suggestions Bulletin entitled *Classroom Learning Centers: Animals (Levels E-I)--A Supplementary Approach for Teaching Science and Art*, Stock No. 41-S-0102.

Hello! The topic of this booklet is animal behavior. Scientists have developed many ways to study animal behavior. For example, they have devised ways to test how "smart" an animal is in performing various tasks. "Through many carefully controlled experiments, psychologists have succeeded in establishing a kind of general ranking of animal IQ for everything from ants to zebras."[1] The following are the ratings of IQ for mammals in rank order:

1. Man
2. Chimpanzee
3. Porpoise
4. Gorilla
5. Orangutan
6. Gibbon
7. Dog
8. Cat
9. Bear
10. Elephant
11. Pig
12. Horse

Graduating with honors:

The Chimp

Is it surprising to find the horse last? Naturally there is some disagreement among various owners of horses on placing the horse at the end of the intelligence list.

Personal inventory

In your CLC notebook, respond to the information requested here:

1. I want to know the answers to these questions about animal behavior

2. I already know the following about animal behavior

Beginning activities

By doing the activities below you will be able to:

1. Design and conduct a controlled experiment to answer the following problem:

---

[1] James Wiley, *Beasts, Brains, and Behavior* (New York: Scholastic Book Services, 1965) p. 8.

Given three equally healthy and untrained mice, design an experiment with a mice maze that will show one factor which influences "learning" in mice.

2. See that birds or animals have a quality of roundness to their shape which is called "form." This makes them appear to have height, width and depth when they are drawn on a flat piece of paper.

Materials

-Books: *A Sourcebook for the Biological Sciences* by Paul Brandwein, Alexander Joseph and Evelyn Morholt, pages 315-16. This is a state text distributed in each elementary school in 1967.

591 *Animals and Their Ways; The Science of Animal Behavior* by John Dennis Carthy. Natural History, 1965.

591 *Animal Appetites* by George Frederick Mason. Morrow, 1966.

591 & Sci(U) *Animal Habits* by George Frederick Mason. Morrow, 1959.

-Filmstrips: Fs 574.5 Animals and Plants of the Field
Fs 591.5 How Animals Use Their Senses

-Assorted wood, chipboard, and house screen (see *Sourcebook* above)

-Cages for each mouse with mouse food, water, sawdust, small box

-1 mounted bird and/or animal checked out from the Natural History Museum

-Gray, tan, brown, or light blue construction paper, 12" x 18"

-Charcoal

-White chalk

Here is what you do:

1. Do reference work using books and filmstrips to prepare a maze for the mice. Write up a plan and make record charts for keeping track of how well each mouse learns to run the maze. Keep an ongoing written report of what you do under these headings:

    a. Hypothesis

    b. Design of Experiment - Procedure (Include how each mouse was fed, rewarded or not rewarded for doing the maze correctly.)

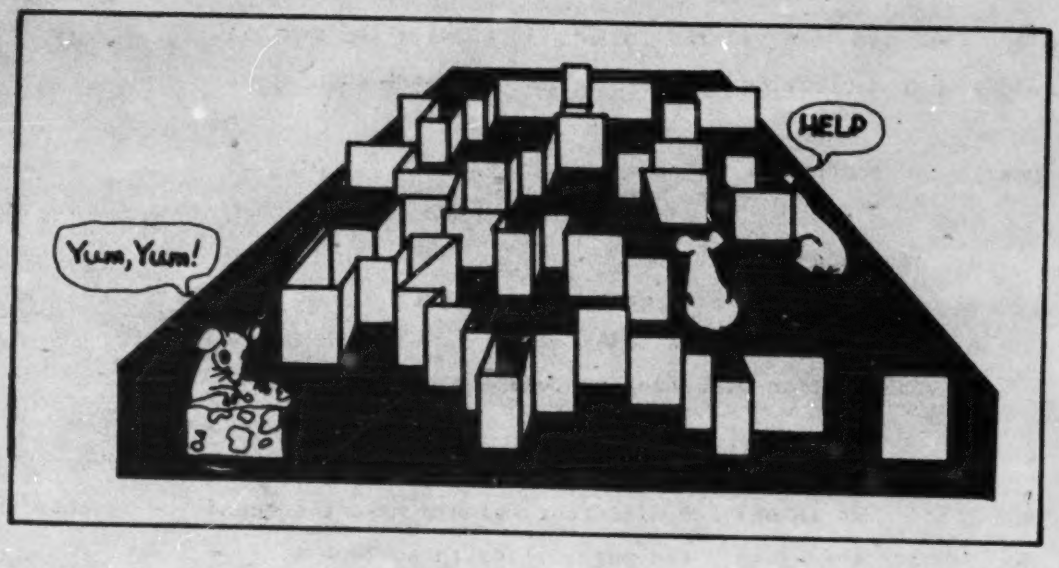
    c. Record of What Mice Did (Record dates, time, conditions.)

    d. Summary of Findings

    e. Conclusion (A brief statement of what you think the reasons were for one mouse doing better than the others.)

2. Make a series of drawings of the mounted bird or animal. Use the colored paper, charcoal, and white chalk. Look for the "roundness" of the appearance of the animal. You can achieve this effect by looking for light and dark areas in shading the animal. Make each drawing fill the paper so there will be little left-over area in the background. As you work on dark and light areas, be sure to include textures such as the shininess of the eye, feathers, or softness of the fur. Make drawings of both sides, from the front, from the back, top and from underneath if possible.

Bulletin Board Idea



or

Exhibit Idea

H-5

CONTRACT FOR MORE STUDY ON ANIMAL BEHAVIOR

Here are some projects related to animal behavior you may wish to do. These are additional activities beyond the ones you have completed.

1. Design and conduct an experiment dealing with any of these:

    a. Training a goldfish
    b. Intelligence of an earthworm
    c. Communication in ants
    d. Hibernation of a frog or toad

2. Go to the Wild Animal Park or the zoo. Gather information from observations and reading as to why two different animals make the sounds or movements you see. Write this into a ten-page, illustrated report.

3. Visit the Natural History Museum. Make drawings of three animals. Make notes on their coloring. Back at school make a mural of these animals in their natural environment. Be sure to show that they have form or have height, width and depth. Plan your mural so that the three animals are the largest and take up most of the paper.

4. Find information on how and why the Indians of the Pacific Northwest used animals on their totem poles. Make sketches of several totem poles. Design and build or carve your own. Be sure to make all sides interesting.

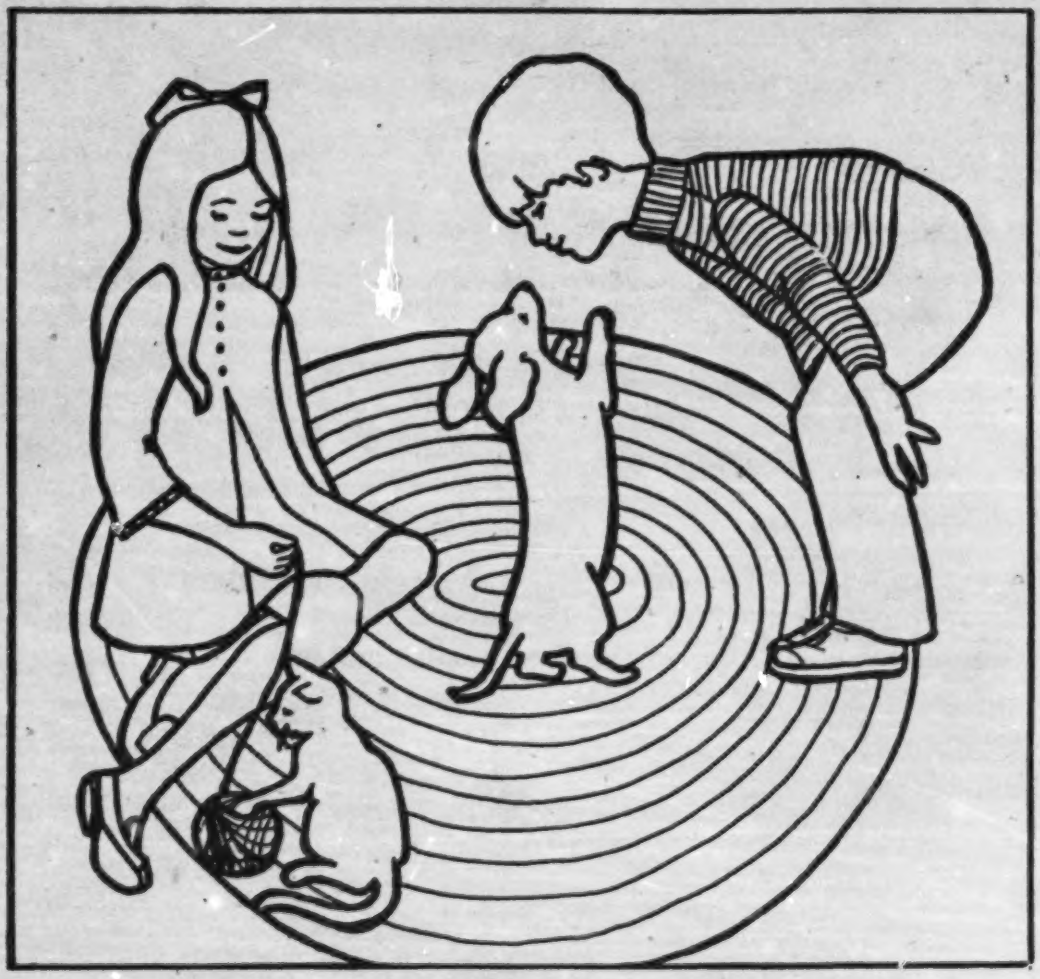
STOCK NO. 31-C-3005

CLASSROOM LEARNING CENTERS: ANIMALS

PUPIL BOOKLET I

Animals in Captivity

- *Living things are interdependent with one another and with their environment.*
- *Artists create in a style unique to them and to the time in which they live.*



Note to the teacher: Before giving this booklet to a pupil, please refer to the Instructional Suggestions Bulletin entitled *Classroom Learning Centers: Animals (Levels E-I)--A Supplementary Approach for Teaching Science and Art*, Stock No. 41-S-0102.

Hello! The topic of this CLC booklet is animals in captivity. Zoos throughout the world are doing their best to care for animals they have in captivity. In San Diego the staffs at the zoo and the Wild Animal Park are experts at doing what is necessary to keep animals healthy while in captivity. Other places that have animals in captivity are pet shops, high school and college biology and psychology laboratories, Sea World, and the Humane Society.

Nutrition is one of the most important aspects in caring for animals in captivity. For example, did you know that an anteater in a zoo is fed a blended mixture of hamburger and milk with mineral and vitamin supplements? There are many factors involved in keeping animals healthy in captivity. You can learn some of the key ways to care for animals in captivity from this CLC experience.

Personal inventory

In your CLC notebook respond to the information requested here:

1. I want to know the answers to these questions about animals in captivity

2. I already know the following about animals in captivity

Beginning activities

1. Design a cage to answer a question like the following:

   What kind of a "house" does a mouse prefer?

   A guinea pig?

   Build a cage that will house two guinea pigs or two mice. Make the inside look as much like the natural habitat of the animals as possible.

2. Locate and collect a variety of artists' interpretations of animals. If the illustrations are in books and cannot be removed, list page numbers or place slips of colored paper between pages to identify pages quickly. Try to include artists who paint realistically as well as artists who use paints freely and more abstractly.

List artists and dates for realistic representations. Make another list for abstract artists.

Materials

-1 ten-gallon aquarium
-Bags of wood shavings (approximately 1 lb.)
-2 pieces of hardware cloth (12" x 24")
-2 animal activity wheels
-2 hamster water feeders
-4 saucers
-2 mice
-2 guinea pigs
-Hamster food
-1 guinea pig cage

-Books: Lubell, Winifred. *A Zoo for You--Some Indoor Pets and How To Keep Them.* Parents Magazine Press, 1970.

Gross, Ruth B. *What Do Animals Eat?* Four Winds, 1973.

Hone, Elizabeth B., Joseph, Alexander, and Brandwein, Paul F. *A Sourcebook for Elementary Science.* Harcourt, Brace & World, Inc., 1967. (Decentralized in 1967 to each elementary school.)

Shannon, Terry, and Payzant, Charles. *Zoo Safari; The New Look in Zoos.* Golden Gate, 1971.

Weeks, Morris. *Inside the Zoo.* Simon and Schuster, 1970.

Chase, Alice Elizabeth. *Famous Paintings: An Introduction to Art.* Platt, 1962.

Riley, Olive Lasette. *Your Art Heritage,* 2nd. ed. McGraw, 1963.

-Filmstrips: Fs 598.1 Learning About Reptiles (39 Fr) P-I
Fs 591.5 Animals Have Homes (38 Fr) I
Fs 591.5 Caring for Warm Blooded Animals (41 Fr) I or J

-Soundstrips: Ss 759.9492 Meet the Artist: Rembrandt (I-J)
Ss 759.6 Meet the Artist: Van Gogh (I-J)
Ss 759.6 Meet the Artist: Picasso - The Early Years (I-J)

-Study Prints: SP-L 759.1 Peaceable Kingdom (Edward Hicks)
SP-M 759.3 Red Horses (Franz Marc)
SP-L 759.1 Circus Elephants (John Marin)
SP-M 759.4 Reaping with Cattle (Jacque Villon)
SP-S 759.945 Tomcat (Paul Klee)
SP-M 759.951 Storks Under Trees
SP-M 759P Brian Wildsmith's Portfolio of Animals

Here is what you do:

1. Design a research project with mice and guinea pigs which answers this problem statement:

   Will mice and guinea pigs show a preference for grains or vegetables when given choices?

   Write the above statement in a "log" notebook and continue to write up a plan, such as this:

   What I Plan To Do: First I will get one cage ready for the two mice and one cage ready for the two guinea pigs. I will put two small saucers side by side in each cage. I will wait 24 hours between introducing each set of food. I will make a chart like this:

DATE	TYPE OF FOOD AND AMOUNT		OBSERVATION NOTES		TIME OF DAY CHECKED
	Saucer #1	Saucer #2	Mice	Guinea Pigs	
	2 oz. Wheaties	2 oz. carrots			
	2 oz. bran	2 oz. lettuce			
	2 oz. sunflower seeds	2 oz. peas			
	2 oz. oatmeal	2 oz. beans			

If I find the chart does not work well, I will change the design.
My time schedule:

April 1-7:	Get materials ready for animals. Review references.
April 7-14:	Place animals in cages and give them recommended diet found in reference books.
April 14-21:	Start research project with different foods.
April 21-May 2:	Write report.

After you have placed the above-type information in your notebook and finished the collection of observation data, you need to write a report. In your report be certain to include these sections:

a. Acknowledgments: Thank the people who helped.

b. Discussion of problem: Explain the problem statement and your reason for choosing it.

c. Materials and procedure: List what you did.

d. Observations and results: Describe what you learned from your chart.

e. Conclusions: State answers you found to your problem statement.

f. Limitations: List any uncertainties you found in your investigation.

g. Bibliography and other sources: Prepare a listing of books, people, filmstrips, etc. you used for references.

2. View soundstrips in this order:
   Meet the Artist: Rembrandt
   Meet the Artist: Van Gogh
   Meet the Artist: Picasso

Record on paper the answers to these questions for each filmstrip.

a. Did the artist attempt to make the painting look like a photograph?
b. Did the artist use easily recognized brush strokes?
c. Were the colors used realistic to the subject?
d. When did the artist live?
e. Do you think other artists of the time painted similar paintings? Why do you think so?

Using the study prints without looking at information on the back, arrange the paintings in order of oldest to newest.

Using information on the back and elsewhere check to see if you have arranged them in proper order.

DISPLAY IDEA FOR SCIENCE AND HOBBY FAIR

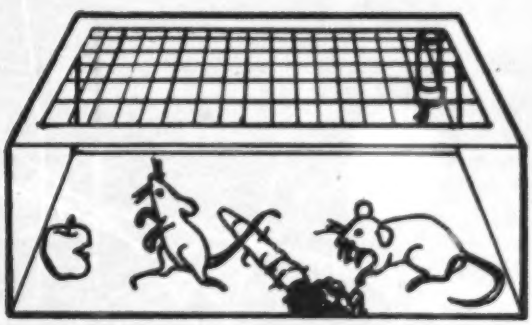
PROCEDURE:

DO MICE PREFER VEGETABLES OR GRAINS?

DATE	V	G	OBSERV

CONCLUSIONS:

LIMITATIONS:



CONTRACT FOR MORE STUDY ON ANIMALS IN CAPTIVITY

Here are some projects related to animal activity you may wish to do. These are additional activities beyond the ones you have completed.

1. Find out what these animals eat in the wild by visiting the Natural History Museum: sea gull, scrub jay, chuckwalla, cottontail, white-footed mouse, raccoon and western gray squirrel. Illustrate a five-to-ten-page report on what you find out.

2. Visit the San Diego Wild Animal Park and list the type of shelters or enclosures that are provided for the lowland gorilla, northern white rhinoceros, zebra and hooded crane. Try to find out from the zoo caretakers or guides how the Wild Animal Park is more helpful to an animal than a small enclosure in a city zoo. Make a five-to-ten-page illustrated report on what you find out.

3. Using various references fill in the following chart and post it on a bulletin board for the entire class to see.

NEEDS OF ANIMALS IN CAPTIVITY (Adults)

Animal	Optimum Temperature Range (°F)	Floor Space	Cage Height	Food per Day and Kind
Guinea pig	65–76°	58 sq. in.		
Horse	60–76°	tie stall, 44 sq. ft. pen, 144 sq. ft.	walls, 6 ft.	
Rabbit				
Goldfish				
Elephant				

4. Using a loan exhibit from the Natural History Museum (bird or animal), paint a picture of it using tempera paint. You may want to attempt a style similar to Van Gogh.

5. Collect cartoons of animals such as Mickey Mouse, Snoopy, Tweetie Bird, Wily Coyote, etc. Compare them to drawings of real animals (mouse, dog, etc.). List exaggerations and differences.

   Select an animal that is not currently appearing in a cartoon strip or comic book and make an original cartoon of it. Remember to exaggerate the features that will make it recognizable while putting it in a situation that would be funny for someone other than the animal.

6. Research the Indian art of totem poles. Find out about the birds and animals carved on them. Create a totem pole out of a stack of gallon ice cream cartons and papier mâché. Add cardboard tubes and egg carton parts to give the totem pole more pattern and three-dimensional effects. Add beaks, wings, tails, eyes, etc. Use colors and designs similar to Indian designs and colors.

APPENDIX

HELPING VANISHING SPECIES†

Today nearly 1,000 species of fishes, reptiles, birds and mammals are approaching extinction. One of the main functions of the San Diego Zoo and Wild Animal Park is to preserve vanishing species. These rare animals are helped by encouraging them to have young in captivity. The park has been particularly successful because the animals have a great deal of space in their enclosures and thus many that do not normally breed in captivity are now having young.

Listed below are familiar vanishing species with the reasons why they are rare. The animals with an asterisk have had young at the zoo or park.

Vanishing Species	Reason (See key below)	Protected by State Law	Protected by Federal Law
Green Sea Turtle	1 4	x	x
Galapagos Tortoise*	1 4 9		x
Desert Tortoise*	10	Illegal to possess	
Alligator	1 2	x	x
Horned Lizard (Horny Toad)	1 10	Possession controlled by state law	
Rosey Boa*			
Brown Pelican	6	x	x
Least Tern	1	x	x
Bald Eagle	1 6 7	x	x
Squirrel Monkey	10		x
Orangutan*	1 10		x
Timber Wolf*	1 5 7	x	x
Polar Bear*	2 5	x	x
Grizzly Bear	5 7		x
Mountain Lion	1 5 7	x	
Tiger*	1 2 3 5 7	x	x
Snow Leopard	2	x	x
Cheetah*	1 2 5	x	x
Przewalski's Wild Horse*	8		
Hartmann's Mountain Zebra*	2 4 8	x	
Rhinoceros*	1 3 5		x
Bighorn Sheep	1 5 8	x	

Reasons:

1. Destruction of natural habitat.
2. Killed for skins, feathers, etc.
3. Killed because of folklore medicine and superstition.
4. Hunted for food.
5. Killed for sport or trophy.
6. Victim of pesticides.
7. Poisoning and predator persecution.
8. Competition with domestic animals.
9. Introduction of alien animals.
10. Trapped for pet market, laboratories, etc.

†Courtesy of San Diego Zoo

Name _____ Date _____

SAN DIEGO NATURAL HISTORY MUSEUM*

FIND THE EXHIBITS THAT GIVE YOU THE CORRECT ANSWERS TO THESE STATEMENTS:

1. _____ The dusky-footed wood rat is common in: (a) chaparral, (b) the eastern part of our desert, (c) coastal scrub habitats, (d) among oaks and pines in the mountains.

2. _____ The Audubon cottontail is: (a) common throughout the county, (b) blind and naked at birth, (c) abundant on the coastal side of the mountains, (d) all of these.

3. _____ The California jackrabbit: (a) is common throughout the county, (b) is born with fur and open eyes, (c) has a lighter-colored species in the desert, (d) all of these.

4. _____ The long-tailed weasel: (a) is active only at night, (b) is very common throughout the county, (c) is a predator of rodents, (d) never kills poultry.

5. _____ Skunks: (a) rarely occur west of the mountains, (b) feed on lizards, and other reptiles, (c) have furs that are of no economic importance, (d) are subject to rabies.

6. _____ Badgers are of great importance because: (a) they are so destructive to rodents, (b) they are uncommon animals, (c) they have powerful, shovel-like feet, (d) they are shy and retiring, but will fight savagely if brought to bay.

7. _____ The largest member of the pigeon family living in California is the: (a) band-tailed pigeon, (b) western mourning dove, (c) cedar waxwing, (d) western tanager.

8. _____ Although western mourning doves are classified as game birds, you should not shoot them because: (a) they feed mainly on weed seeds, (b) one dove's stomach contained 7,500 weed seeds, (c) it is one of our most beneficial species, (d) all of these answers.

9. _____ The "Year Round Hummer" of the San Diego region is the : (a) ruby-throated hummingbird, (b) scarlet hummingbird, (c) Anna's hummingbird, (d) none of these answers.

10. _____ The San Pedro Martir coyote is commonly called: (a) a varmint, (b) the prairie wolf, (c) sneak wolf, (d) chicken catcher.

11. _____ Wading shore birds that have very long down-curved bills are: (a) western willets, (b) marbled godwits, (c) long-billed curlews, (d) avocets.

12. _____ A wading shore bird with a long, slightly up-turned beak and red legs is the: (a) black-necked stilt, (b) green-winged teal, (c) avocet, (d) western willet.

13. _____ Mushrooms: (a) can be easily determined whether or not they are poisonous, (b) that are poisonous have no known antidote, (c) are parasitic, (d) are saprophyles, (e) all of these answers.

*Courtesy of the San Diego Natural History Museum

14. _____ Which of these statements are not true:
(a) About 250 sq. yds. of leaf surface produces enough starch to feed a man a year.
(b) Green plants produce about 200 billion tons of organic carbon a year.
(c) Plants synthesize sugars, starches, fats, proteins, and cellulose.
(d) Plant chlorophyll is contained in small structures called "stoma."

15. _____ The conifer tree commonly having four needles in a cluster is the:
(a) Parry pinon, (b) Torrey pine, (c) sugar pine, (d) Coulter pine.

16. _____ Which of these statements are not true?
(a) Oak galls are occasionally used for making inks and dyes.
(b) Oak galls contain a high percentage of tannic acid, used in tanning leather.
(c) White sage galls are caused by insects in the order Lepidoptera.
(d) Some galls may be inhabited by several species of insects.

17. _____ The California shrike is commonly called: (a) butcher-bird, (b) cactus wren, (c) wren tit, (d) bush tit.

18. _____ The avocet is: (a) a resident of freshwater marshes, (b) commonly called "blue stockings," (c) commonly called "cobbler's awl bird," (d) all of these answers.

19. _____ The sea gull with a red spot on its lower beak is the: (a) California or Western gull, (b) Hermann's gull, (c) Sabin's gull, (d) none of these answers.

20. _____ How many grams of DDT will prevent a pelican's egg from developing normally? (a) 0.0045, (b) 1.00, (c) 3.00 (d) 10, (e) none of these.

21. _____ The "Clown of the Pine Forest" is the (a) stellar jay, (b) marbled godwit, (c) pine squirrel, (d) California shrike.

22. _____ The largest living bird in flight is the: (a) condor, (b) golden eagle, (c) bald eagle, (d) none of these.

23. _____ The first true bird, which lived about 130 million years ago, was the: (a) condor, (b) archaeopteryx, (c) aardvark, (d) artiodactyla, (e) none of these.

24. _____ Hummingbirds have only _?_ feathers. (a) 200, (b) 300, (c) 900, (d) (d) 1,200.

25. _____ The only bird which uses a tool, a cactus spine to extract insects from holes, is the: (a) shrike, (b) woodpecker finch, (c) pigmy nuthatch, (d) Bewick's wren.

26. _____ The egg of the extinct elephant bird of Madagascar had a capacity of: (a) one quart, (b) three quarts, (c) one gallon, (d) two gallons.

27. _____ How many species of living birds do ornithologists now recognize? (a) 5,200, (b) 6,756, (c) 8,600, (d) over 1,000.

28. _____ Most marine birds have a special "salt gland" to extract salt from their blood;
(a) this gland is probably a modified salivary gland.
(b) this gland is located within their kidneys.
(c) this is popularly believed, but is not true.

29. _____ The bird which lays triangular-shaped eggs which will not roll off their nesting ledge is the: (a) red viro, (b) black-bellied plover, (c) bufflehead, (d) murre.

30. _____ There are about ___?___ species of insects contained in the phylum Arthropoda: (a) 350,000, (b) 850,000, (c) 980,000, (d) 1,500,000.

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EVALUATION FORM

Name of Evaluator _____ Phone No. _____

Name of School _____ Grade(s) _____

Title(s) of Classroom Learning Center(s): Animals evaluated

I. Major strengths

II. Major weaknesses

III. Specific suggested changes (list page references)

Use back of sheet and additional sheets if needed. Return completed form to Science Specialist, Education Center, Room 2041, or Art Specialist, Annex 4, Education Center.